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Fig. 1

TGMV <sub>1</sub>	MRNSSSTPPSIKAQHRAAKRRRAIRRRRIDLNCGCSIYIHIDCRN--NGF	Seq. ID No.: 1
AbMV-HI	MRSSSPSHPPSIKKAHRQAKRRRAIRRRRIDLQCGCSIYFHIDCTG--HGF	Seq. ID No.: 2
AbMV-WI	MRSSSPSQPPSIKKAHRQAKRRRAIRRRRIDLQCGCSIYFHIDCTG--HGF	Seq. ID No.: 3
BDMV	MQSSSLSTPPSIKKAHRQAKRRRAIRRRRIDLECGCSIYIHIGCTG--HGF	Seq. ID No.: 4
BGMV-DR	MRSSSPSQPPSIKAQHRIAKRRAIRRRRIDLNCGCSIFYHIKCAD--HGF	Seq. ID No.: 5
BGMV-Ga	MRSSSPSQPPSIKAQHRIAKRRAIRRRRIDLNCGCSIFYHIKCAD--HGF	Seq. ID No.: 6
BGMV-J	MRSSSPSQPPSIKAQHRIAKHKAIRRRRIDLNCGCSIFYHIKCAD--HGF	Seq. ID No.: 7
CabLCV	MQNSSLLKPPSIKAQHRIAKRRAVRRRRIDLNCGCSIFLHINCAD--NGF	Seq. ID No.: 8
PYMV	MRSSSPSQPPSIKKAHRQAKKRAIRRRRIDLDCGCSIYFHIDCAG--HGF	Seq. ID No.: 9
SGMV	MRSSSPSTPPSIKTHRQAKKRSVRRRRIDLECGCSIYFHIGCTG--HGF	Seq. ID No.: 10
SqLCV-E	MPNSSSSKVPSIKAQHRIAKKRAVRRRRIDLDCGCSIYFHINCAKDGNGF	Seq. ID No.: 11
TcMV	MRSSSPSQPPSIKRAHRQAKKRAIRRRRVLDLQCGCSIYFHLGCAG--HGF	Seq. ID No.: 12
TPV	MLNSSSTLPSIKAQHRIAKKRPIRRRRIDLNCGCSIFLHINCAN--NGF	Seq. ID No.: 13
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TGMV	THRGTYHCASSREWRLYLGDNKSPLFQDNQRRGSPLHQHDIPLTNQVQP	Seq. ID No.: 1
AbMV-HI	THRGTHCTSGGEWRVYLGDKKSPVFQDVQSRRTIIHQNENIPCTNTVQP	Seq. ID No.: 2
AbMV-WI	THRGIHCTSGGEWRVYLGDSKSPVFQDIQSRGPAIHQNEIPCTNTVQP	Seq. ID No.: 3
BDMV	THRGAHCTSSREWRLYLGDNRKSPVFQDIQSRGTVVHQQQGIQRTDTVQP	Seq. ID No.: 4
BGMV-DR	THRGEHHCASGREFRFYLGGTSPFLFQDHAGGRSSIHTDKDIPHPNQVQS	Seq. ID No.: 5
BGMV-Ga	THRGEHHCASGREFRFYLGGTSPFLFQDNAGGRSSIHTDKDIPHPNQVQS	Seq. ID No.: 6
BGMV-J	THRGEHHCASGREFRFYLGGTSPFLFQDHAGGRSSIHTDKDIPHPNQVQS	Seq. ID No.: 7
CabLCV	THRGEHHCSSGREFRFYLGGSKSPIFQDTTRRGVPHQNDLPHPSPVQP	Seq. ID No.: 8
PYMV	THRGAHCTSGREWRLYLGDNRKSPFLFQDKPSRGHAIHQDQDIQRPNPVQP	Seq. ID No.: 9
SGMV	THRGTHCTSFREWRLYLGDNRKSPFLFQDIQGRGSTVHEHQDIQYPNPVQP	Seq. ID No.: 10
SqLCV-E	THMGRHHCASGREFRFYLGGSKSPLFQDVQRGGSTLHAKDIPHTNPVQP	Seq. ID No.: 11
TcMV	THRGTHCTSGGEWRVYLGARKSPFLFQDTQSRGPTVYQNEGIPRTDTVQP	Seq. ID No.: 12
TPV	THRGEHHCASGREFRFYLGGSKSPIFQDTARGGPVPHQNDIPHRSPVQP	Seq. ID No.: 13
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TGMV	QPEESIGSPQGISQLPSMDDIDDSFWENLFK	Seq. ID No.: 1
AbMV-HI	QPEESVASPQSLPELPSLDDIDESFWVNLFS	Seq. ID No.: 2
AbMV-WI	QPEESVASPQSLPELPSLDDFDDSFVWNLFS	Seq. ID No.: 3
BDMV	QPEESVASPQSLPELPSLDDIDDSFWVDLFK	Seq. ID No.: 4
BGMV-DR	QPQESTGSPQSIPELPSLDDIDSSFWDDIFK	Seq. ID No.: 5
BGMV-Ga	QPQESTGSPQSIPELPSLDDIDSSFWDDIFK	Seq. ID No.: 6
BGMV-J	QPQESTGSPQSIPELPSLDDIDSSFWDDIFK	Seq. ID No.: 7
CabLCV	QPTESIGSPQSLLQLPSLDDFDESFWADIFK	Seq. ID No.: 8
PYMV	QPQESIGSPQSIPELPSLDDIDDSFWVELPS	Seq. ID No.: 9
SGMV	QPEESVASPQSVPELPSLDDIPDSFWVDLFK	Seq. ID No.: 10
SqLCV-E	QPEESTKSSQSVPELPSLDGIDSSFWDDIFE	Seq. ID No.: 11
TcMV	QPEESVASPQSLPELPSLDDVDDSFWINLFS	Seq. ID No.: 12
TPV	QPTSSISSPQGIPFPPLDDFDDSFWDIFK	Seq. ID No.: 13
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Fig. 2

clone #	mutation description	5' primer	
pTGA618	81-129 wt	gcggaattccctctacaccaacaccag	Seq. ID No.: 24
pTGA618A	1-129 wt	cgcggaattcatgcgaaattcgtctcc	Seq. ID No.: 26
pTGA619	81-129 S122A	gcggaattccctctacaccaacaccag	Seq. ID No.: 28
pTGA620	81-129 F123A	gcggaattccctctacaccaacaccag	Seq. ID No.: 30
pTGA621	81-129 W124A	gcggaattccctctacaccaacaccag	Seq. ID No.: 32
pTGA622	81-129 F128A	gcggaattccctctacaccaacaccag	Seq. ID No.: 34
pTGA679	81-114 wt	gcggaattccctctacaccaacaccag	Seq. ID No.: 36
pTGA680	81-120 wt	gcggaattccctctacaccaacaccag	Seq. ID No.: 38
pTGA681	81-125 wt	gcggaattccctctacaccaacaccag	Seq. ID No.: 40
pTGA682	81-129 E125A	gcggaattccctctacaccaacaccag	Seq. ID No.: 42
pTGA713	101-129 wt	cgcggaattcgaggagagcattggatctcca	Seq. ID No.: 44
pTGA714	114-129 wt	cgcggaattcagtatggacgacatcgac	Seq. ID No.: 46
pTGA715	114-129 I119A	cgcggaattcagtatggacgacgacgacgac	Seq. ID No.: 48
pTGA716	103-129 wt	cgcggaattcagcattggatctccacaaggc	Seq. ID No.: 50
pTGA717	81-129 K129A	gcggaattccctctacaccaacaccag	Seq. ID No.: 52
pTGA718	81-129 L127A	gcggaattccctctacaccaacaccag	Seq. ID No.: 54
pTGA719	81-129 N126A	gcggaattccctctacaccaacaccag	Seq. ID No.: 56
pTGA720	117-129 D117A	cgcggaattcgccgacatcgacgacagc	Seq. ID No.: 58
pTGA721	117-129 D118A	cgcggaattcgacgccatcgacgacagc	Seq. ID No.: 60
pTGA722	117-129 D117A, D118A	cgcggaattcgccgcatcgacgacagc	Seq. ID No.: 62
pTGA723	120-129 wt	cgcggaattcgacgacagcttcgggag	Seq. ID No.: 64
pTGA724	117-129 D120A	cgcggaattcgacgacatcgccgacagcttc	Seq. ID No.: 66
pTGA725	117-129 D121A	cgcggaattcgacgacatcgacgccagcttc	Seq. ID No.: 68
pTGA726	117-129 D120A, D121A	cgcggaattcgacgacatcgccgccagcttc	Seq. ID No.: 70
pTGA727	41-129 wt	ggcggaattcatggactgcagaacaatgga	Seq. ID No.: 72
pTGA728	10-129 wt	gcggaattctctatcaaagctcaacac	Seq. ID No.: 74

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Fig. 2 (con't)

clone #	mutation description	3' primer	
PTGA618	81-129 wt	cgcgagctcctatttaaataagttctccca	Seq. ID No.: 25
PTGA618A	1-129 wt	cgcgagctcctatttaaataagttctccca	Seq. ID No.: 27
PTGA619	81-129 S122A	cgcgagctcctatttaaataagttctcccagaaggcgtcgtcgat	Seq. ID No.: 29
PTGA620	81-129 F123A	cgcgagctcctatttaaataagttctcccaggcgtcgtcgtc	Seq. ID No.: 31
PTGA621	81-129 W124A	cgcgagctcctatttaaataagttctccgcgaagctgtc	Seq. ID No.: 33
PTGA622	81-129 F128A	cgcgagctcctatttagctaaagttctc	Seq. ID No.: 35
PTGA679	81-114 wt	gcggagctcctaaagttgagaaatgcc	Seq. ID No.: 37
PTGA680	81-120 wt	gcggagctcctagatgtcgtccatact	Seq. ID No.: 39
PTGA681	81-125 wt	gcggagctcctaccagaagctgtcgtc	Seq. ID No.: 41
PTGA682	81-129 E125A	gcggagctcctatttaaataagttgtccagaa	Seq. ID No.: 43
PTGA713	101-129 wt	cgcgagctccctctaaccctgtgtatgcg	Seq. ID No.: 45
PTGA714	114-129 wt	cgcgagctccctctaaccctgtgtatgcg	Seq. ID No.: 47
PTGA715	114-129 I119A	cgcgagctccctctaaccctgtgtatgcg	Seq. ID No.: 49
PTGA716	103-129 wt	cgcgagctccctctaaccctgtgtatgcg	Seq. ID No.: 51
PTGA717	81-129 K129A	cgcgagctcctatgcaaataagttctc	Seq. ID No.: 53
PTGA718	81-129 L127A	cgcgagctcctatttaaataagttctc	Seq. ID No.: 55
PTGA719	81-129 N126A	cgcgagctcctatttaaataaggcctccca	Seq. ID No.: 57
PTGA720	117-129 D117A	cgcgagctccctctaaccctgtgtatgcg	Seq. ID No.: 59
PTGA721	117-129 D118A	cgcgagctccctctaaccctgtgtatgcg	Seq. ID No.: 61
PTGA722	117-129 D117A, D118A	cgcgagctccctctaaccctgtgtatgcg	Seq. ID No.: 63
PTGA723	120-129 wt	cgcgagctccctctaaccctgtgtatgcg	Seq. ID No.: 65
PTGA724	117-129 D120A	cgcgagctccctctaaccctgtgtatgcg	Seq. ID No.: 67
PTGA725	117-129 D121A	cgcgagctccctctaaccctgtgtatgcg	Seq. ID No.: 69
PTGA726	117-129 D120A, D121A	cgcgagctccctctaaccctgtgtatgcg	Seq. ID No.: 71
PTGA727	41-129 wt	cgcgagctcctatttaaataagttctccca	Seq. ID No.: 73
PTGA728	10-129 wt	cgcgagctcctatttaaataagttctccca	Seq. ID No.: 75

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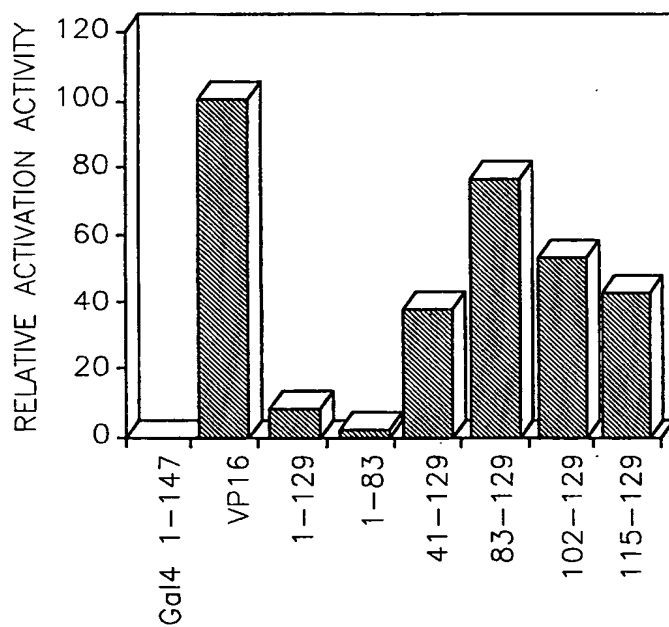


Fig.3

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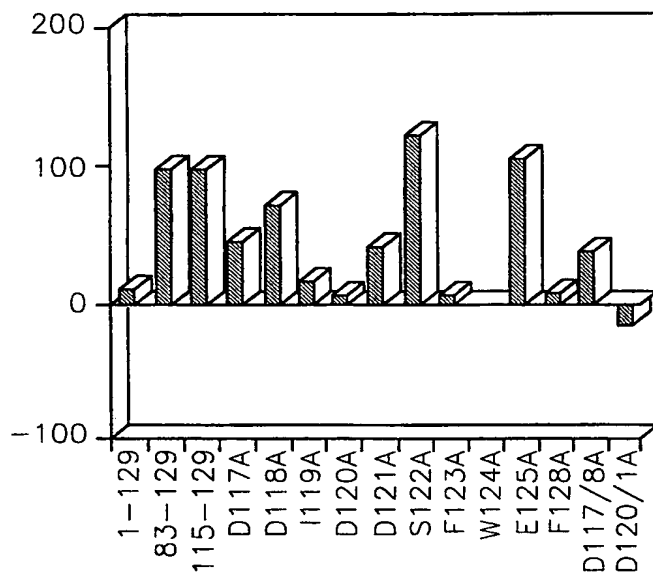


Fig.4A

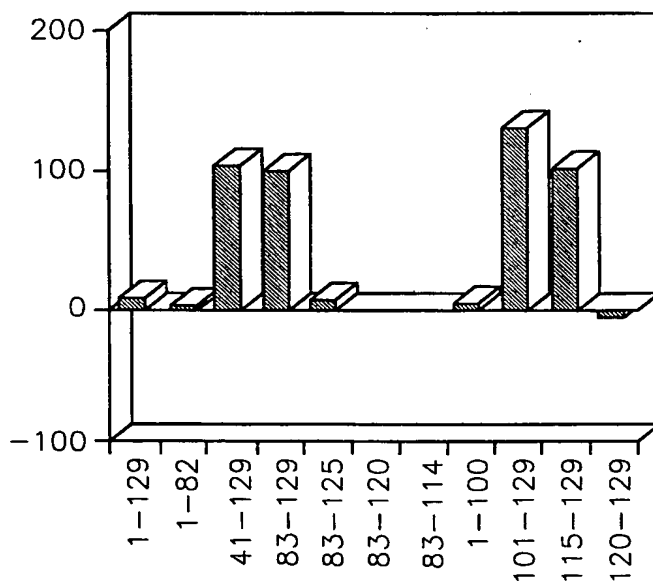


Fig.4B